Cognitive Dissonance: A Closer Look at the Spreading of Alternatives

Honors Research Thesis

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Abstract:

According to the theory of cognitive dissonance (Festinger, 1957), choosing between two close alternatives can create discomfort because of the conflict involved in rejecting a desirable option (if the two choice options are desirable) or in choosing an undesirable option (if the choice options are both undesirable). According to dissonance theory, individuals try to reduce this discomfort by evaluating chosen options more favorably and/or evaluating unchosen options less favorably (a phenomenon known as "spreading of alternatives"). Traditional critiques by Bem (1967) and recent critiques by Chen and Risen (2010) have challenged the role of dissonance-based discomfort in post-choice spreading of alternatives. The current research attempts to address the critiques in two ways. First, showing a role for measured discomfort would help to make a case for dissonance. Second, previous work using an essay-writing paradigm has found dissonance effects to be stronger when the essay is counterattitudinal rather than proattitudinal. This suggests that spreading might be more driven by dissonance when choosing between two disliked rather than two liked options. Research participants evaluated a set of food items and were randomly assigned to make a choice between either two equally favorable options or two equally unfavorable options. Attitudes were measured before and after the choice, and the level of discomfort was also measured after the choice but before the post-choice ratings of the alternatives. Spreading was observed for choices between both positive and negative options. Also, as might be predicted from dissonance theory, spreading of positive alternatives was driven by shifts in evaluation of the rejected more than the chosen option. However, post-choice discomfort did not predict spreading. Results supporting dissonance theory and its alternative theories were found.

Introduction

Whenever people have to make a decision, such as choosing what to wear or with whom to spend time, some choices have multiple options and the consequences must be weighed before selecting a decision. As a result, people may face discomfort when picking and choosing options. Festinger's (1957) cognitive dissonance theory argues that people can experience conflict when opting to forego a favorable option or when opting to accept an unfavorable option. When this occurs, people become motivated to reduce this discomfort after the choice has been made.

More specifically, the theory states that when individuals have to make a choice, have beliefs, or partake an action that contradicts other choices, beliefs, or actions, people face a psychological discomfort (i.e., cognitive dissonance). In an attempt to remove this discomfort, people will make choices or adjust their beliefs in a way that does not contradict other beliefs or choices (Festinger, 1957). The theory posits that in an attempt to make cognitions consistent with one another, they are changed. Dissonance can be reduced by changing public statements or actions, or through changing private opinions. When there is little justification for inconsistent action, such as receiving a trivial reward to lie to others in saying that a previous boring task was interesting, opinion change is likely (and more likely than if substantial justification – such as adequate compensation – is received). This is known as induced compliance. Generally, the less justification for engaging in dissonant actions, the more attitude change occurs privately in an attempt to reduce the discomfort (Festinger, 1962).

A classic induced compliance study done by Festinger and Carlsmith (1959) predicted that greater awards for behavior (i.e. external motivators) would predict smaller

attitude change. They argued that if someone says or acts in a way that contradicts his or her attitude, there is attitude change as a result of the discomfort. Additionally, the more reward given to change attitudes, the smaller the amount of change is actually done (Festinger & Carlsmith, 1959). Attitude change is driven by unpleasant arousal coming from dissonance. Zanna and Cooper (1974) asked or required that participants write a counterattitudinal essay. Consistent with dissonance theory, more attitude change occurred when free to choose whether to write the essay than when forced to do so. Also, when participants could attribute unpleasant arousal to a pill, the dissonance-based attitude change (in free choice conditions) did not occur.

Similar changes in attitudes have also been seen in the free choice paradigm. In the seminal research using this paradigm, participants were asked to choose between two objects after rating eight objects (Brehm, 1956). Their personal investment in the experiment was heightened by instructions that the task was for eight household objects' manufacturers, that the participant would have to spend substantial time using the object, and that one of the products would go home with them. Participants rated the objects on an eight-point scale of desirability. After rating the eight objects, two items were chosen by the researchers and participants were told to select one of them. Dissonance was experimentally manipulated by having participants choose between two items that were either very closely related (i.e., evaluations differed only slightly), or less closely related (i.e., evaluations for the options were more discrepant). Closely related options would create more difficult choices, so more discomfort would presumably be experienced if choosing between two equally liked or disliked things. Less closely related choices would be easy to choose between, so the individual would presumably experience less

discomfort. After the choice, participants were given reports with both positive and negative features about the objects and then were asked to rerate the objects. Consistent with the theory, results indicated that following a choice between two comparably desirable objects, there was a shift in post-choice evaluations such that the chosen and unchosen options were rated more positively and negatively, respectively. (No change was observed between pre- and post-choice evaluations when the choice was ostensibly easy, between two disparately desirable objects.) This "spreading of alternatives" is presumed to occur as a way to rationalize the decision and reduce any dissonance involved in rejecting a favorable option or accepting an undesirable option (Brehm, 1956).

Spreading of alternatives provides a way to reduce the discomfort in a difficult decision by rationalizing the choice. Specifically, in order to justify a decision, individuals tend to evaluate the chosen option more positively and the rejected option more negatively, relative to pre-choice evaluations (Brehm, 1956). Put another way, after choosing between two equally favorable options, the person can rationalize the decision by giving greater emphasis to the positive attributes of the chosen option and/or the negative attributes of the rejected options. This spreading has been seen in other studies, such as in Egan, Bloom, and Santos (2010). Egan and colleagues (2010) argued that induced preferences showed that in both children and monkeys, rejecting an object under induced compliance settings showed spreading, particularly by devaluing the unchosen item.

DeWall, Chester, and White (2015) attempted to see if spreading effects would be dulled if participants took acetaminophen (a pain reducer commonly known as Tylenol

that has been shown to dull social pain neurologically (DeWall, MacDonald, Webster, Masten, Baumeister, Powell, Combs, Schurtz, Stillman, Tice, Eisenberger, 2010). Participants either chose between two equally liked tasks after having taken acetaminophen or not. When participants had taken the pain reducer, post-choice spreading of alternatives was smaller, and the negative experiences of decision making (such as social rejection) were also reduced compared to participants who had not taken acetaminophen (DeWall et al., 2015). Thus, as the social pain (in this case presumed dissonance-based discomfort) was reduced, so was the spreading of alternatives. Thus far, this study may be one of the strongest cases for discomfort-driven spreading of alternatives. Even so, no direct measure of experienced discomfort was used, so evidence for involvement of discomfort is indirect, and the effects of acetaminophen on spreading have not been replicated. Thus, additional evidence supporting a role for discomfort in spreading of alternatives would be useful.

Such evidence would be especially useful in light of the ongoing debate over whether post-decisional attitude change is or is not about resolving discomfort. Alternatives include possibilities that the individual may learn about his or her own preferences in the process of making the choice or by observing his or her own behavior. Self-perception theory provided one of the earliest general alternatives to Festinger's (1957) theory. Bem (1967) characterized self-perception as an "individual's ability to respond differentially to his own behavior and its controlling variables" (p. 184). Bem (1967) argued that within the free choice paradigm the observed attitude changes are not a result of dissonance, but rather interpersonal judgment that changes before and after the choice. That is, according to self-perception theory, there is no tension or aversive state

driving the attitude change seen in traditional dissonance studies (Bem, 1967). Instead, self-perception theory would suggest that when spreading occurs, it does so as a result of looking at the choice and interpreting the choice as indicative of one's attitude(s). Put another way, if one chooses between (previously equally evaluated) option X and option Y and selects the former, the decision maker would infer that he or she must genuinely prefer option X (and correspondingly, not prefer option Y) and adjust post-choice evaluations accordingly.

In an attempt to address the debate between the proposed mechanisms of dissonance and self-perception, Elliot and Devine (1994) conducted two counterattitudinal essay studies. In the first study, Elliot and Devine (1994) showed that when discomfort occurred it could be measured, and that participants reduced this psychological tension by changing their attitudes in the direction of the attitude-discrepant behavior in alignment with dissonance theory. In their second experiment, researchers examined whether providing writing under free choice conditions would provide support for self-perception theory by aiming to see if the removal of choice would create more dissonance, which it did not. The participants who freely wrote the counterattitudinal essay did have higher levels of dissonance in alignment with Festinger's (1957) theory (Elliot & Devine, 1994).

Some say that dissonance is more likely to be seen in attitude-discrepant behavior when writing an essay that falls in one's latitude of rejection rather than one's latitude of acceptance. The latitude of rejection provides the range of positions that a person is not willing to accept, and when participants write an essay that falls into that latitude, more dissonance is experienced than when the same essay position falls in the person's latitude

of acceptance (Fazio, Zanna, & Cooper, 1977). When the position of the essay falls within the range that a person is willing to accept (i.e., latitude of acceptance), attitude change can also occur, but that change is not due to dissonance. Rather, self-perception (i.e., the inference of one's attitude based on attitude-relevant behaviors; Bem, 1967) is thought to be the driving force of attitude change in this context. In the discussion section, I revisit the debate between cognitive dissonance and self-perception as the impetus of attitude change following attitude-discrepant behavior.

Little research has examined how the overall favorability of the closely-evaluated options plays a role in spreading of alternatives. From a dissonance standpoint, it could be that differences in valence of the pair of options could affect the amount of discomfort that is experienced. Having to choose between two equally liked options (where neither option is a bad one) might not create as much dissonance as when a person has to choose between two equally disliked things (where neither option has much in the way of positive features). Such a pattern would parallel the results seen in previous studies (Fazio et. al, 1977) where dissonance plays less of a role when accepting attitudes that align with essays written in one's latitude of acceptance rather than accepting attitudes consistent with an essay written in their latitude of rejection. In general, it makes sense that less dissonance might be created when accepting a positive (within the latitude of acceptance) rather than accepting a negative (one in the latitude of rejection). However, recent criticisms by Chen and Risen (2010) have made a unique argument against a role for dissonance in the free choice paradigm. Chen and Risen (2010) state that spreading can occur in the free choice paradigm even without attitude change. That is, even when two options are rated equally (especially when those pre-choice ratings are normative

ratings rather than those made by the participants themselves), choices may reveal any slight differences in existing evaluations, and those evaluations are then clarified in the post-choice ratings. Another explanation, according to Chen and Risen (2010), could be that the attitude change comes from discovered preferences while making the choice. That is, as part of making the choice itself, different features of the options may be considered and change attitudes as part of the choice itself (Chen & Risen, 2010). This type of "discovered preference" could be similar to effects of writing an essay in one's latitude of acceptance that nonetheless shifts one's attitudes to become more consistent with that essay than it was previously (cf. Fazio et al., 1977).

Study Hypotheses

The hypotheses for the current study concerned two focal questions. First, as both traditional and recent critiques question the role of dissonance in spreading of alternatives, might a stronger case be made for dissonance through measured discomfort in this paradigm, as it did in the induced compliance (counter-attitudinal essay writing) paradigm (Elliot & Devine, 1994)? Second, might this measured discomfort differ when people are deciding between closely evaluated options of different valence? To address both, the research measured discomfort and examined discomfort in choices between two positive or two negative choice options.

True to the original free choice paradigm, participants first evaluated a set of items before being asked to make a choice between two of them. Unique to the current research, the valence (positive or negative) of these options was also taken into account. All decisions were constructed to be difficult (i.e., between two equally evaluated alternatives). However, to test whether there are different effects of a difficult-yet-

desirable decision versus a difficult-and-undesirable decision on both dissonance and post-decisional attitude change, participants made a choice between two equally liked alternatives or between two equally disliked alternatives, respectively.

Consistent with a role for dissonance in spreading of alternatives, I predicted that choice valence would differ by discomfort post-choice. Dissonance-based discomfort should positively predict spreading of alternatives based on previous cognitive dissonance studies; as more discomfort is present, more spreading of alternatives should occur. Thus, it could be that the amount of reported discomfort would predict the amount of spreading within negative choice pairs. If such spreading is driven by dissonance, the greatest portion of that discomfort may lie in accepting an unwanted option. If so, then spreading may be driven by shifts in evaluation of the accepted option more so than shifts in evaluation of the rejected option (see Figure 1). Spreading and dissonance might be different, however, when choosing between two positive options. In such choices, to the extent that dissonance is present, the most dissonance should come from rejecting something an individual likes. If rejecting favorable options creates dissonance, then spreading might be driven primarily by devaluing rejected positive options (see Figure 1). It could be, though, that the role of dissonance is lessened in positive choices, because ending up with a desirable option is not a bad outcome.

Participants first evaluated a set of food items and were randomly assigned to make a choice between either two equally favorable options (the positive-choice condition) or two equally unfavorable options (the negative-choice condition). After initial ratings and the choice, discomfort (used to predict the differences of ratings after the choice) was measured, followed by post-choice evaluations.

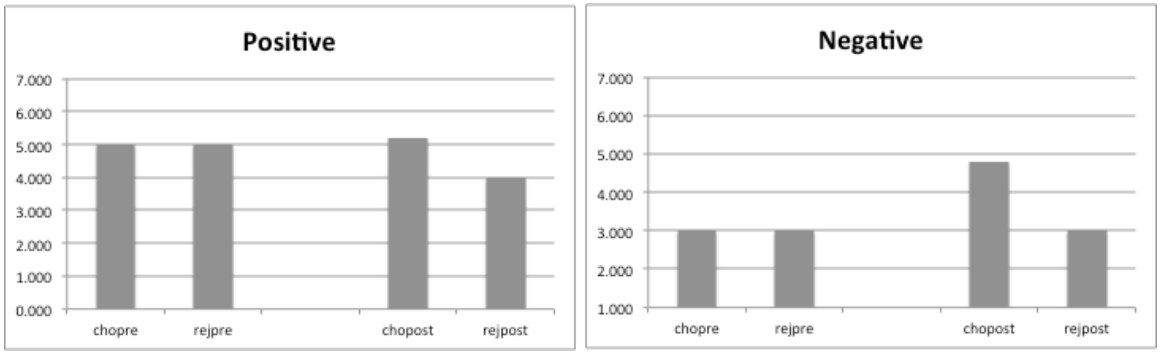

Figure 1. Asymmetrical spreading predictions where more spreading is seen in the negative condition. ChoPre and ChoPost represent the chosen item's pre-choice and post-choice ratings, respectively. Similarly, RejPre and RejPost are the rejected item's pre-choice and post-choice ratings.

Methods

A. Participants and Materials

Participants were recruited through the Ohio State Department of Psychology's Research Experience Program (REP) for course credit. Four hundred twenty-nine participants completed prescreening and were therefore eligible to complete the study. From that pool of eligible people, 111 took the lab portion, but seven participants did not pass an attention check (in which they reported whether they were or were not paying attention) or made food spelling errors that affected the meaning of later questions in the study (such as fires for fries). The study was completed using the online software Qualtrics (Qualtrics, 2016-2017). Participants' ages ranged from 18 to 34 (M=19.35, SD=2.515). More females (N=76) completed the study than men (N=24).

B. Procedures

To create a baseline of attitudes and aid in creating individualized choice pairs ahead of the lab session, participants evaluated 37 food items online via a semantic differential scale. The baseline ratings were on a 1-7 scale of extremely dislike to extremely like (Table 1).

Table 1
Food Items

Food	*M*	*SD*
Almonds	5.196	1.945
Apple pie	5.541	1.808
Avocado	4.93	2.086
Bananas	5.824	1.685
Black olives	3.278	2.295
Bran muffin	4.13	2.088
Cabbage	3.42	1.96
Carrots	5.579	1.602
Chicken Pot Pie	4.943	2.137
Corn	5.459	1.658
Cottage cheese	3.44	2.275
Craisins	4.358	2.196
Dill pickles	4.602	2.234
Fig newton	4.312	2.12
Fried chicken	5.248	2.087
Fries	6.056	1.426
Grapes	6.284	1.292
Hard boiled eggs	4.44	2.22
Jalapeno peppers	3.413	2.274
Jello	5.05	1.974
Kale	3.991	2.084
Muffins	4.46	.535
Nachos	5.787	1.663
Peanut butter	5.59	1.845
Pomegranates	5.22	1.95
Popcorn	6.09	1.337
Pound cake	5.61	1.816
Pretzels	5.908	1.411
Prunes	2.97	2.025
Radishes	2.925	1.975
Raw broccoli	4.63	1.955
Rice cake	4.973	1.907
Semisweet chocolate	5.963	1.466
Strawberries	6.367	1.086
Trail mix	5.523	1.687
Tofu	3.505	2.134
Twinkies	4.296	2.21
Yogurt	5.807	1.542

In the lab, each participant was told that he or she was participating in a taste test. This was done to increase personal relevance and investment overall in alignment with

previous studies (cf. Harmon-Jones et. al., 1996). In order to examine food ratings in the same laboratory taste test setting as for the post-choice ratings, participants also made pre-choice ratings in the lab. That is, under the ruse of the taste test, participants were told that in order to assist the researchers in choosing the most appropriate food option for them, participants needed to evaluate potential food items. Based on the prescreen ratings, two evaluated food items that were as close as possible in their evaluation (either equally positive or equally negative) were identified for each participant prior to their arrival in the lab. Each participant was randomly assigned to the positive-choice or negative-choice condition (the favorable or unfavorable food condition). On the seven point scales, items rated 5 or 6 were considered positive ratings, and items rated 2 or 3 were considered negative ratings. Out of the 37 items rated in prescreening and being randomly assigned to a condition, two food options were chosen as the equally liked or equally disliked ones. 18 other food items were fillers. Each item was evaluated on a seven point scale on liking (1= extremely dislike, 7= extremely like), tastiness (1= extremely untasty, 7= extremely tasty), and health (1=extremely unhealthy, 7=extremely healthy). These were averaged for the pre-choice rating. Participants were then asked to choose between the initially equally liked or disliked options as determined from prescreening. After the choice, they were asked to report their level of discomfort and then to re-evaluate the two choice options on liking (1-7 again) which served as the post-choice rating.

C. Independent variables.

Condition. Using a random number generator, participants were randomly assigned to their condition (1 or 2). Condition 1 was the positive-choice condition and condition 2 was the negative-choice condition.

D. Dependent variables.

Spreading of alternatives. Spreading of alternatives was calculated based on shifts from the pre-choice to post-choice ratings for both the chosen option and the rejected one. The *shifts in chosen* were the chosen pre-choice ratings (the average of liking, tastiness, and healthiness) subtracted from the chosen post-choice ratings (ChoPost-ChoPre). The *shifts in rejected* were the rejected pre-choice ratings subtracted from the rejected post-choice ratings (RejPost-RejPre). Spreading was the difference in shifts for the chosen and rejected options (ChosenShift – RejectedShift) or [(ChoPost-ChoPre) - (RejPost-RejPre)].

Discomfort. Discomfort was calculated by taking the average of five ratings. The ratings were from 1-7 for soothed/irritated, calm/anxious, comfortable/uncomfortable, easy/uneasy, and unbothered/bothered (cf. Elliot & Devine, 1994). Higher numerical scores indicate higher discomfort and lower numerical scores indicate lower discomfort.

Distance. Distance was the absolute value of the difference of the ratings of the two choice items made in the lab prior to making the choice.

Results

Spreading of alternatives. As mentioned previously, shifting in chosen and rejected options made up the spreading of alternatives. Spreading did occur, as seen in the table and figures below. The significance of overall spreading was tested by conducting a single-sample *t*-test on the spreading index. Spreading was significantly positive, M =

.962, t(103) = 5.51, p < .001. Spreading occurred close to equally across the positive-choice condition (*M*=.896, *SD*= 1.51) and the negative-choice condition (*M*=1.018, *SD*=1.995), t(102) = -.347, p = .729 (see Figures 2, 3).

In addition to the presence of overall spreading, there was a pattern suggesting that the shifts may be primarily driven by those options and actions that might be expected to create the most dissonance. In an analysis of the components of spreading, the shifts in the chosen option, there was more of a shift in the negative-choice condition (*M*=.4643, *SD*= 1.93) than in the positive-choice condition (*M*= -.1042, *SD*= 1.60), but the difference did not reach significance t(102) = -1.616, p=.109. For shifts in the rejected option, there was less of a shift in the negative-choice condition (*M*= -.55, *SD*=1.264) than in the positive-choice condition (*M*= -1.00, *SD*= 1.62), but the difference was also not significant there, t(102)= -1.575, p=.118. In both cases, however, the larger shift was in the condition where that shift would address the element of the choice that could create dissonance (i.e., foregoing a favorable option or accepting an unfavorable option). Thus, one might consider the locus of the spreading to be largely consistent with overall dissonance-based predictions.

The results involving distance of the pre-choice evaluations were not very supportive of dissonance. Distance was not a predictor of the amount of spreading in the positive-choice condition, F(1, 46) = 2.597, p = .114, but it was in the negative-choice condition, F(1, 54) = 23.147, p < .001. In the positive condition, distance was in the positive direction (*b*=.77), inconsistent with dissonance theory as larger numbers of distance indicates that the scores are further apart (meaning that in this case dissonance is increasing when the distance increases- a less difficult choice). In the negative condition,

there was a negative relationship (*b*=-.91) where, as distance increased, dissonance decreased. This does support dissonance theory where, as distance increases (pre-choice ratings are further apart, making an easier choice) discomfort decreases.

Descriptive Statistics

Please enter condition number.		N	Minimum	Maximum	Mean	Std. Deviation
1	chopre	48	4.00	7.00	5.2917	.65097
	chopost	48	1.00	7.00	5.1875	1.65871
	rejpre	48	4.00	7.00	5.3333	.69446
	rejpost	48	1.00	7.00	4.3333	1.82574
2	chopre	56	1.00	7.00	2.9643	1.37463
	chopost	56	1.00	7.00	3.4286	1.71472
	rejpre	56	1.00	6.00	2.6071	.92792
	rejpost	56	1.00	5.00	2.0536	1.11876

Figure 2. Mean scores for the chosen and rejected pre-choice and post-choice ratings, broken up by condition 1 (positive) and 2 (negative.)

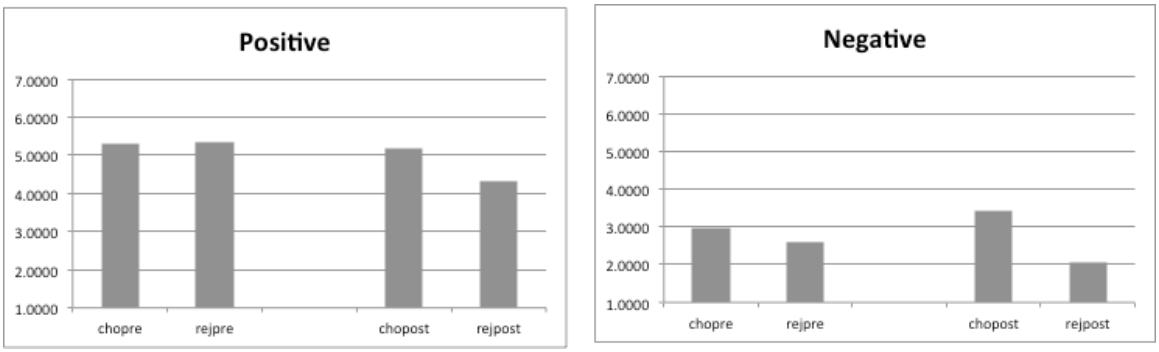

Figure 3. Graph of mean scores for the chosen and rejected pre-choice and post-choice ratings, showing spreading of alternatives.

Discomfort. Overall, the discomfort measures were highly correlated (Cronbach's alpha = .912), so they were combined into a composite measure of discomfort. As anticipated, there was more discomfort in the negative-choice condition (M = 3.67, SD = 1.43) than the positive-choice condition (M = 3.25, SD = 1.76), but the two conditions did

not differ significantly, t(102) = -1.61, p = .11). Distance of the two pre-choice ratings was not a significant predictor of discomfort in either the positive-choice condition, F(1, 46) = 1.473, p = .231, or the negative-choice condition, F(1, 54) = .369, p = .546, nor did it overall F(1, 102) = .372, p < .554. It was in a positive direction (*b*=.084), so when the two options are farther apart from one another, the more discomfort was experienced, not in alignment with dissonance theory.

Relations between discomfort and spreading. Discomfort did not predict spreading in the positive-choice, F(1, 46) = 1.66, p = .204) or negative-choice condition, F(1, 54) = 1.515, p = .224). In breaking apart the spreading of alternatives, discomfort did predict the shifts from pre- to post-choice ratings of the chosen alternative in both the positive-choice condition, F(1, 46) = 11.608, p = .001, and negative-choice condition, F(1, 54) = 4.347, p = .042. Across conditions, shifts in the chosen option were also significantly predicted by discomfort, F(1, 102) = 10.42, p = .002. However, in both conditions and overall, the relation between discomfort and the chosen shift was negative [positive (*b*=-.61), negative (*b*=-.37), overall (*b*= -.41)]. That is, more discomfort was associated with less positive shifts – a direction opposite to dissonance-based spreading. Results were a bit different for shifts in the rejected option, though. Discomfort did not significantly predict the shifts, F(1, 102) = 3.268, p = .074. Here, however, a negative direction also presents itself where more discomfort was associated with more negative shifts of the rejected option – a direction consistent with dissonance-based spreading. Discomfort also was not a significant predictor of shifts in the rejected option within each choice condition [positive-choice condition, F(1, 46) = 3.6, p = .084, and negative-choice condition, F(1, 54) = 1.367, p = .248]. These, too, produced negative relations between

discomfort and shifts in the rejected option. The direction of each of these was consistent with potential dissonance-based spreading, but the relation that was closer to significant was for the choice that I thought might produce less dissonance overall (i.e., a choice between two positive options).

Discussion

At the outset of this research, two questions were posed: whether discomfort was responsible for post-choice spreading of alternatives and whether pre-choice valence of the choice options impacts post-choice spreading of alternatives. In the current study at least, discomfort and spreading did occur. However, discomfort was not connected to the pre- to post-choice shifts in evaluation in the ways that would make dissonance a clear explanation for all of the observed spreading of alternatives. In reference to criticisms of dissonance-based explanations for spreading (Chen and Risen, 2010; Bem, 1967), there could be a number of reasons why spreading might occur even in the absence of dissonance-based discomfort. Thus, overall, some of the results of this study might support dissonance explanations (Festinger, 1957) or alternative mechanisms that do not produce dissonance as part of attitude change (e.g., Bem, 1967).

In support of cognitive dissonance theory, psychological discomfort is occurring, especially when the choice is between two less than desirable options. Also, in comparison with participants' own pre-choice ratings, there is post-choice spreading of alternatives (seen most clearly in the graph of chosen/rejected mean scores).

However, spreading of alternatives as explained by Brehm (1956) was not predicted by the amount of discomfort experienced when making a difficult choice. As the psychological tension is the central basis for cognitive dissonance theory and aspects

of spreading of alternatives have been critiqued by Chen and Risen (2010), this could support self-perception theory (Bem, 1967). An additional confusing aspect of the results is that distance did not predict discomfort in either condition (though it did overall, and the direction in which it relates within each condition does support dissonance theory in the negative condition, but not in the positive). Distance of the initial ratings of choice items did not predict post-choice discomfort. The relations are mostly positive so that as distance increases, discomfort increases - inconsistent with dissonance theory. In other words, according to Dissonance Throry, the harder the choice, the more psychological discomfort should occur after choosing one of the two options. However, that was not generally true. Despite this, many instances of inconsistent relations with dissonance theory are non-significant, making it difficult to confidently conclude that they do not support dissonance theory. Additionally, some of these non-significant results could be coming from unequal pre-choice evaluations of the two choice objects in the negative-option condition (as seen in Figure 3).

Additionally, many of the food options could have been perceived as relatively positive (or liked) options, which made it difficult to create sufficiently (and equally) negative (disliked) pairs of options (as seen in Table 1). Thus, adding more negative food items might have been useful for the negative condition. Another potential flaw in the method could also be creating non-significant results. The five dissonance measures used to create mean discomfort come from counter-attitudinal essay studies conducted by Elliot and Devine (1994). Their study used over 20 different discomfort items, whereas the current study used only five. Perhaps the five that were chosen were not as well suited to discomfort following choice as they were for discomfort following essay writing.

When breaking down each discomfort measure used, the only one that significantly predicted spreading was unbothered/bothered. However, it was in a negative direction (*b*=-.227). Thus, there was little indication that the discomfort measure produced results consistent with dissonance theory. Overall, it is possible that the measures might have tapped into more general unease (e.g., by having to consider negative options) rather than discomfort from the difficulty of the choice itself.

The current research outcomes create a bit of a dilemma. Both dissonance and alternative theories attempt to explain the same experience. The results, however, fit in some ways with dissonance and not in others. The data are not as straightforward as dissonance holding for some types of decisions and self-perception for others, however, as some patterns within the same decisions seem potentially consistent with dissonance but others are not. This makes one consider potential problems with the study that could be impacting the data. The sample size for each condition was not large, and food options may not be creating enough dissonance to create a strong pattern, even if participants believed that they were choosing items they would have to later taste. Thus, one issue may concern whether alternative methods might have produced stronger experiences of discomfort.

Another potential issue may concern the timing of the various measurements. Past research suggests that the feeling of regret immediately after the decision might make people focus on negative features of the chosen option or on positive features of the rejected option. Walster and Walster (1970) argued that more such regret should be experienced when choosing between more negative choice options. Regretting one's choice, though, could push one toward devaluing the chosen option and valuing the

rejected option, especially if post-choice evaluations are taken before dissonance takes hold. That is, from a dissonance perspective, initial regret should give way to dissonance-based discomfort and efforts to reduce the discomfort. As a result, it seems possible that the discomfort measure might be partly picking up regret, and slightly different timing of the discomfort measure might provide more consistent relations with shifts in the relevant evaluations. As the measure of discomfort constitutes the primary avenue to provide unique support for dissonance theory, future research should deal carefully with the structure and timing of the discomfort measure. On a related note, the timing of the post-choice evaluations could also be affected by immediate post-choice regret and provide less consistent patterns than might come about with a bit more time for dissonance to take hold.

Therefore, it seems that this study has data supporting both dissonance theory and alternative theories, making it difficult to clearly state which is the origin of spreading of alternatives. It may well be that spreading can sometimes reflect efforts to reduce dissonance-based discomfort and sometimes reflect other more purely cognitive processes. Future research must be done to provide clarifying results to explain the cause of spreading.

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